**Program 14(b)**

**Write a program to implement 2-D rotation.**

#include<stdio.h>

#include<graphics.h>

#include<math.h>

#define ROUND(a) ((int)(a+0.5))

void ddaline(int x1, int y1, int x2, int y2)

{

float xsteps, ysteps, x=x1, y=y1;

int dx = x2-x1;

int dy = y2-y1;

int steps,k=1;

if(abs(dx)>=abs(dy))

steps=abs(dx);

else steps=abs(dy);

xsteps= dx/(float)steps;

ysteps= dy/(float)steps;

putpixel(ROUND(x),ROUND(y),15);

while(k<=steps)

{

x+=xsteps;

y+=ysteps;

putpixel(ROUND(x), ROUND(y),15);

k++;

}

}

void rotate(int x1, int y1, int x2, int y2, float theta)

{

int xtmp, ytmp;

xtmp = x1 + ROUND ((x2-x1)\*cos(theta) - (y2-y1)\*sin(theta));

ytmp = y1 + ROUND ((x2-x1)\*sin(theta) + (y2-y1)\*cos(theta));

ddaline(x1,y1,x2,y2);

ddaline(x1,y1,xtmp,ytmp);

}

int main()

{

int x1, x2, y1, y2;

float theta;

int gdriver = DETECT, gmode, errorcode;

initgraph(&gdriver, &gmode, "..\\");

errorcode = graphresult();

if (errorcode != grOk)

{

printf("Graphics error: %s\n", grapherrormsg(errorcode));

printf("Press any key to halt:");

getch();

exit(1);

}

printf("Enter start point\n");

scanf("%d %d", &x1, &y1);

printf("Enter end point\n");

scanf("%d %d", &x2, &y2);

printf("Enter value of angle to rotate line about starting point\n");

scanf("%f", &theta);

rotate(x1, y1, x2, y2, theta);

getch();

closegraph();

return 0;

}



